

Assignment 01

PUBH 8878

1. Laird, Section 2.4, Exercise 3
2. Laird, Section 2.4, Exercise 4
3. Laird, Section 2.4, Exercise 7
4. Consider a sample size of n of unrelated haploid individuals is obtained from some population with the objective of estimating allele frequency at a biallelic locus. The sample contains x copies of A , and $n - x$ copies of a .
 - a. Plot the probability distribution of X given $n = 30$, and $\theta = .1$. Plot the probability distribution of X given $n = 1000$, and $\theta = .1$.
 - b. Lets say we observed 30 samples, with 10 copies of allele A . Plot the likelihood function for θ
 - c. What is the MLE of θ ?
 - d. Let's say $n = 1000$, and $x = 100$. What is the sampling variance of $\hat{\theta}$?
 - e. Let's say $n = 100$, and $x = 10$. What is the sampling variance of $\hat{\theta}$? Why is this different than the result above?